



Department of Energy
Richland Operations Office
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0063111

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Mr. Michael A. Wilson, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99352

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Dear Mr. Wilson:

200-UR-1 UNPLANNED RELEASES OPERABLE UNIT RI/FS WORK PLAN

This letter is in response to Ecology's letter from John Price to Larry Romine, same subject, dated August 16, 2004.

The U.S. Department of Energy, Richland Operations Office (RL) has evaluated Ecology's comments on the work plan referenced above. The proposed resolutions to those comments are attached. If you have any questions, please contact me, or your staff may contact Matt McCormick, Office of the Assistant Manager for the Central Plateau, on (509) 373-9971.

Sincerely,

Keith A. Klein
Manager

AMCP:SLB

Attachment

cc w/attach:
D. B. Bartus, EPA
R. G. Bauer, FHI
L. D. Crass, FHI
L. J. Cusack, Ecology
S. Harris, CTUIR
J. S. Hertz, FHI
R. Jim, YN
T. Martin, HAB
K. Niles, ODOE
R. E. Piippo, FHI
J. B. Price, Ecology
L. Seelatsee, Wanapum

J. P. Shearer, FHI
P. Sobotta, NPT
Administrative Record (200-UR-1)

**RESPONSES TO ECOLOGY COMMENTS ON THE 200-UR-1 RI/FS WORK PLAN, DRAFT A RE-ISSUE
(DOE/RL-2004-39)**

| Comment Number | Page | Comment | Response |
|-----------------------|--|--|---|
| 1. | Title | Delete "and Engineering Evaluation/Cost Analysis" from the title. | Comment Accepted with Modifications. Title will be changed to 200-UR-1 Unplanned Releases Waste Group Remedial Investigation/Feasibility Study Work Plan and Proposed Response Alternatives |
| 2. | Page iii Executive Summary 1 st paragraph | Could probably discuss wind-blown contamination as a causal factor in last sentence. I think one of the largest URs, several square miles from a burial ground, was exacerbated by airborne dispersal. | Comment Accepted. Will include statement that redistribution of radiologically contaminated particulates by the wind and/or animal intrusion has occurred at some locations. |
| 3. | Page iii 1 st paragraph | Change to "The 200-UR-1 OU consists of 148 waste sites" with the addition of West Lake site. | Comment Accepted. |
| 4. | Page iii 2 nd paragraph | Delete 2 nd paragraph and replace with: "The U.S. Department of Energy, Richland Operations Office and the Washington State Department of Ecology agreed that the nature and extent of environmental contamination at many of the 200-UR-1 waste sites could be characterized using the "Observational Approach." That approach was previously described in the <i>200 Areas Remedial Investigation/Feasibility Study Implementation Plan – Environmental Restoration Program</i> , DOE/RL-98-28. It is a method of planning, designing, and implementing a remedial action that uses a limited amount of initial field characterization data to generate an understanding of field conditions. Then, additional information is gathered during remedial actions to make "real time" decisions in the field to guide the direction and scope of actions, based on contingency planning | Comment Accepted with Modifications (wordsmithing). |

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| | | performed before mobilization to the field. Sites identified for the application of the observational approach would be candidates to excavate contaminated soil for disposal at the Environmental Restoration Disposal Facility.” | |
| 5. | Page iv 2 nd paragraph | Change “further actions” to “response actions”. | Comment Accepted. |
| 6. | Page iv 2 nd paragraph | Insert the following new paragraph: The U.S. Department of Energy, Richland Operations Office and the Washington State Department of Ecology also agreed that the West Lake site, which was previously in the 200-CW-1 operable unit, did not fit the operable unit definition for 200-CW-1. They agreed that it was actually more like an unplanned release. Accordingly, it has been added to this work plan. It is also a candidate for completion of the RI/FS process along with the B/C Controlled Area. | Comment Accepted |
| 7. | Page iv 3 rd paragraph | Delete “unique and” | Comment Accepted. |
| 8. | Page iv 3 rd paragraph | In 3rd bullet, change “removal actions” to “response actions”. | Comment Accepted with Possible Modifications. Need clarification from Ecology concerning the meaning of “response actions” versus “removal actions” for candidate RTD sites. Removal action is the terminology used in CERCLA. |
| 9. | Page iv 3 rd paragraph | In the 4 th bullet, change “RI/FS candidate site.” to “RI/FS candidate sites (B/C Control Area and West Lake)”. | Comment Accepted. |
| 10. | Page v 1 st paragraph | Replace first bullet with: “An evaluation of alternatives and costs for the candidate RTD sites that is the equivalent of an engineering evaluation/cost analysis”. | Need to discuss the requested change in wording from “EE/CA” to the “equivalent of an EE/CA” with Ecology. If the information provided in the |

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| | | | document does not constitute and EE/CA, DOE RL is not clear on the regulatory pathway that will be followed for the candidate RTD sites. |
| 11. | Page V 2 nd paragraph | Change "65" sites to include the sites that were not approved for reclassification, and correct this through the document. | Comment Accepted. |
| 12. | Page v 2 nd paragraph | Change "Completion of the EE/CA prepared for the 65 candidate RTD sites resulted in selecting the remedy of" to "Evaluation of alternatives for the 52 candidate RTD sites resulted in the recommended response of". | See response to comment 10 above. Need additional clarification form Ecology concerning the proposed terminology and the regulatory pathway that will be followed for the candidate RTD sites. |
| 13. | Page v 2 nd paragraph | Change "The removal remedy was identified for 52 sites" to "Excavation and disposal was recommended for 52 sites." | Comment Accepted with Modifications. |
| 14. | Page v 2 nd paragraph | Delete the last sentence. There is probably no greater uncertainty about removal costs than there is for maintaining the existing soil cover/institutional controls/and monitored natural attenuation. | The unit costs for surveillance and maintenance are assumed the same as the current unit cost for these activities done annually on the sites. Additional discussion concerning the cost basis for this alternative is provided in Appendix C in Section 2.2. More uncertainty is associated with removal costs because the actual removal volumes will be determined using the observational approach. Required removal volumes drive the costs of many associated actions such as mobilization/demobilization, excavation, loading, transportation, disposal costs, decontamination, backfill, and |

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| | | | revegetation. The cost basis for RTD sites is discussed in section C3.1.1. |
| 15. | Page v 3 rd paragraph | Delete "The DQO also addressed waste characterization requirements" This sentence does not add anything to the paragraph that the first sentence had not already stated. If it is implying something different, change sentence to further explain the meaning. | Comment Accepted with Modifications. Text will be changed to indicate the DQO process addressed the identification of characterization objectives for determination of contaminant distribution, verification of completeness of a removal response, and the waste characterization requirements needed for disposal of removed material. |
| 16. | Page vii 1st paragraph | In last full bullet, change "The direct exposure pathway has been eliminated at many of these surface release sites." to "The short-term threat from the direct exposure pathway has been abated at many of these surface release sites." Please note that according to WAC 173-340, it isn't eliminated unless there's 15 feet of clean fill. Also, the pathway is not eliminated; it's being mitigated by ongoing maintenance including application of pesticides. | Comment Accepted with Modifications. Text will be changed to state that the short-term threat from the direct exposure pathway has been abated at many of these surface release sites. Placement of a cover soil on the site, in conjunction with ongoing maintenance activities, such as application of pesticide/herbicides, have mitigated direct exposure. These maintenance activities eliminate plant uptake and disturbance of the soil cover. |
| 17. | Page vii 2nd paragraph | Change "The most significant of these exceptions is the BC Controlled Area." to "The largest and most complex of these exceptions is the BC Controlled Area and the West Lake." | Comment Accepted with Modifications. Will be restated as "Two of the largest sites, the BC Controlled Area and the West Lake, are located outside the core zone." |
| 18. | Page vii 4th paragraph | Change "The data collected during the BC Controlled Area RI/FS" to "The data collected during the RI/FS for the BC Controlled Area and the West Lake". | Comment Accepted. |

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| 19. | Page 5-5 | Change Section 5.3 title to "Response Action Objectives". | See response to comment 8. Need clarification from Ecology concerning the meaning of "response actions" versus "removal actions" for candidate RTD sites. Removal action is the terminology used in CERCLA. |
| 20. | Page 5-5 | Change Section 5.4 title to "Identification of Response Action Alternatives". | See response to comment 8. Need clarification from Ecology concerning the meaning of "response actions" versus "removal actions" for candidate RTD sites. Section 5.4 is where alternatives are identified. |
| 21. | Page 1-1 1 st paragraph | Add location of BC controlled area and west lake after the discussion of the site locations. Since these are the candidates for RI/FS studies, they should specifically be noted their location. | Comment Accepted. |
| 22. | Page 1-2, 1 st paragraph | Change "unique" to "additional". | Commented Accepted. |
| 23. | Page 1-2 2 nd bullet | Change "EE/CA" to "equivalent of an EE/CA". | The work plan contains all the elements of an EE/CA. Need clarification from Ecology concerning what the regulatory path would be for candidate RTD sites if an EE/CA has not been completed. |
| 24. | Page 1-3 1 st paragraph | Change 147 to 148. | Commented Accepted. |
| 25. | Page 1-3 4 th bullet | Change "Presents an EE/CA" to "Presents the equivalent of an EE/CA". | See response to comment 23. Text changes will be made throughout the document when concurrence is established concerning the appropriate wording. |

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| 26. | Page 1-4 | In #3, change “removal” to “response” – each occurrence. | See response to comment 23. Text changes will be made throughout the document when concurrence is established concerning the appropriate wording. |
| 27. | Page 1-4 Section 1.2.2 | Delete this section. We can proceed on this pathway w/o callout in this work plan. | Additional discussion is needed with Ecology concerning the regulatory pathway (action memorandum or a ROD). The regulatory pathway must be identified in the work plan. |
| 28. | Page 2-7 3 rd paragraph | Tank farms in 200 West Area also include S, SX, and SY. | Commented Accepted. |
| 29. | Page 2-13 1 st paragraph | Change 147 to 148 waste sites (2 sentences in paragraph). | Commented Accepted. |
| 30. | Page 2-13 4 th paragraph | Change “candidate RI/FS site” to “candidate RI/FS sites”. | Commented Accepted. |
| 31. | Page 2-14 | Is “radiolometric” a typographic error? If not, it should be defined in a parenthetical. | Comment Accepted with Modifications. Term should be “radiometric”. |
| 32. | Page 2-14 Section 2.2.3.2 | Add characteristics of west lake site as well, or alternatively add a section 2.2.3.3. Waste Site Characteristics of the West Lake area. | Commented Accepted. |
| 33. | Page 2-20 and other site tables | The order of the sites listed does not make sense—it does not appear to be numerical, as 200-E-26 is down near the end of the list instead of before 200-E-29, and so on. A listing strategy should be applied to this table and all other tables (including tables 5-6 and 5-7) so that site code numbers are easier to look up. | Commented Accepted. |
| 34. | Page 2-20 | Add west lake WIDS site code. | Commented Accepted. |
| 35. | Page 3-3 | 4 th sentence in §3.2.3, please delete sentence “As a result . . . and the environment.” and replace with “Although sampling and long-term monitoring of sites in the 200 | Transport mechanisms involved in creation of some of the UPR waste sites have included contaminant distribution |

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| | | Areas has generally focused on larger and more contaminated waste sites, there is substantial data related to many of the small UPRs because of the mode of contaminant release (often through biological transport)." | by wind and animals. Contaminated materials include radioactive particles/specks, feces, urine, and tumbleweed parts. Need clarification from Ecology concerning inclusion of the statement "substantial data". |
| 36. | Page 3-3 Section 3.2.3 | The unplanned releases are relatively important in the Hanford environment: e.g., contamination is relatively more bio-available if relatively less concentrated/radioactive: but that sense doesn't come through in this discussion. Also, given there importance, I suspect that there is relatively more bio-monitoring data for these sites than for any other OU, but that sense doesn't come through either. Add some text to emphasis these points. | RL is not aware of a data source that supports the statement that there is more bio-monitoring data for these sites (UPRs) than for any other OU. Bioavailability to contamination at UPR sites that have a soil stabilization cover is limited. Further discussion is needed with Ecology concerning data sources before making these statements in the work plan. |
| 37. | Page 3-3 Section 3.2.3 | Add west lake information to section (specifically 1 st paragraph section). | Commented Accepted. |
| 38. | Page 3-7 Section 3.4 paragraph | The thin stabilization cover is an important part of the physical conceptual model for many of these sites. Also, the shallow depth of the contamination is an important aspect of the "nature" of contamination. Add supporting text to that effect. | The shallow depth of contamination for the site conceptual models is discussed on page 3-8. A discussion concerning the characteristics of the stabilization cover occurs on pages 3-8 and 3-9. |
| 39. | Page 3-7 | Change "Point of release: surface or subsurface release." to "Point of release: surface or subsurface release, and thickness of interim stabilization cover compared to 15 foot standard point of compliance in WAC 173-340." | The bullet list of factors presented in the beginning of section 3.4 are the general <u>physical parameters</u> that are taken into consideration when developing a contaminant distribution model. Regulatory compliance requirements are not one of the physical properties considered in development of the contaminant distribution models. |

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| | | | Specific attributes of the UPR contaminant distribution models are discussed on pages 3-8 and 3-9. |
| 40. | Page 3-9 | Change last bullet from "Approximately one-half of the sites identified for a removal action have been stabilized and covered with clean soil/material reducing the potential for direct exposure." to "Approximately one-half of the sites identified for a response action have been stabilized and covered with a thin (compared to 15 ft thick) clean soil/material reducing the short-term potential for direct exposure." | This discussion presents the physical characteristics of the contaminant distribution models for the UPR sites. Reference to a regulatory specification concerning a 15 ft thick interval of soil in this section is out of context. |
| 41. | Page 3-10 | Add to the bullets another one that says: <ul style="list-style-type: none"> Plant and animal uptake and transport to other biological receptors or humans. | The first bullet in Section 3.5.2 identifies "Ingestion of contaminated soils, sediments, or biota" as an uptake mechanism for humans and biota. Not sure of the intended meaning for the statement of "transport to other biological receptors or humans" other than through a secondary release mechanism as shown on Figure 3-5. Need additional clarification from Ecology concerning the need for inclusion of this bullet to the text. |
| 42. | Page 3-10 Section 3.5.2 and page 3-17 Figure 3-5 | The leaching pathway to groundwater has been dismissed for contamination at depths less than 15 feet. The regulations in WAC 173-340 require consideration of this pathway, regardless of depth. It is extremely important that if there is justification for dismissing this pathway that it be provided in detail using a quantitative basis. Prepare one or more paragraphs that describe in detail why this pathway was dismissed. Also provide appropriate calculations that support dismissing this | Comment Accepted. Additional discussion will be added describing the reasons why that the UPR waste sites would not contribute to ground water contamination. Results of transport modeling for the volume of a liquid release that would be required to be able to potentially reach ground water will be presented. |

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| | | pathway. Insert the paragraphs and calculations in section 3.5.2. Ecology must approve dismissal of this pathway and cannot do so without complete and accurate justification. | |
| 43. | Page 3-13 Section 3.6, general | In this section insert a table of all contaminants on the initial list, the facility that generated each contaminant, and the reason for elimination of each contaminant, instead of the bullets on p. 3-12. In the table define words such as "minor quantities" and "mobility". | As discussed in Section 3.6, the DQO assessment process for determining the COCs for 200-UR-1 waste sites was completed and presented in WMP-19920 (pending). A general discussion of the exclusion rational presented in the DQO is shown in the Work Plan. The 200-UR-1 DQO incorporated the completed COC assessment process and elimination rational developed and presented in other 200 Area OU DQO documents. Meaning of "minor quantities" and "mobility" will be provided in the text. Please note, a CD was provided to Ecology containing the current draft of the 200-UR-1 DQO document during Ecology's review of the Draft A Work Plan. |
| 44. | Page 3-15, 3-16 Figures 3-3 and 3-4 | The figure is misleading because it does not depict the lateral spreading that occurs at textural change boundaries in the subsurface. The spreading must be considered in the conceptual model. Please revise the figures to indicate lateral spreading. | Comment Accepted with Modifications. Lateral spreading would only occur in layered alluvial deposits with pronounced grain size heterogeneity in depositional bedding. Sedimentary deposits with these characteristics could be present at some locations in the Hanford FM sands but probably not in gravel deposits. The lateral extent of the spreading would be related to the |

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| | | | volume of a liquid release and the lateral continuity of the layers/strata. Additional lateral spreading will be shown in Figures 3-3 and 3-4. |
| 45. | Page 3-18 Table 3-1 | Dermal absorption for semi-volatile organic compounds should be evaluated. Dermal absorption fractions are relatively high for these compounds – refer to WAC 173-340 equations 740-4 and 740-5 to determine soil cleanup levels based on direct contact including dermal contact for semi-volatile organic compounds. | This is an incorrect application of the WAC requirements, as only <u>Modified</u> Method B includes dermal absorption. The 200-UR-1 Work Plan uses <u>Standard</u> Method B calculations for determination of PRGs. Dermal absorption <u>is not</u> included in <u>Standard</u> Method B. |
| 46. | Page 4-1 Section 4.0 | <p>Replace 1st paragraph with the replacement paragraph provided for the Executive Summary:</p> <p>“The U.S. Department of Energy, Richland Operations Office and the Washington State Department of Ecology agreed that the nature and extent of environmental contamination at many of the 200-UR-1 waste sites could be characterized using the “Observational Approach.” That approach was previously described in the <i>200 Areas Remedial Investigation/Feasibility Study Implementation Plan – Environmental Restoration Program</i>, DOE/RL-98-28. It is a method of planning, designing, and implementing a remedial action that uses a limited amount of initial field characterization data to generate an understanding of field conditions. Then, additional information is gathered during remedial actions to make “real time” decisions in the field to guide the direction and scope of actions, based on contingency planning performed before mobilization to the field. Sites identified for the application of the observational approach would be candidates to excavate contaminated</p> | See response to comment 4. Text in both sections of the document will be changed for consistency. |

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| | | soil for disposal at the Environmental Restoration Disposal Facility.” | |
| 47. | Page 4-1 Section 4.0 | <p>The text states that during the DQO process the 200-UR-1 waste sites were identified for four proposed future actions:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Rejection or no action <input type="checkbox"/> Reassignment to another OU..... <input type="checkbox"/> Use of the observational approach to conduct RTD <input type="checkbox"/> Completion of an RI/FS <p>Later in the text monitored natural attenuation is listed as the proposed remedy for some of the waste sites. Where did this option come from? Please document the source in the text in the appropriate places.</p> | Comment Accepted. Sites identified as candidates for MESC/IC/MNA were presented in Section 5 as part of the alternative analysis for a removal response. Text will be modified in appropriate places to clarify how the process was conducted to identify the two preferred remedies (RTD and MESC/IC/MNA). |
| 48. | Page 4-1 2nd paragraph | Change “streamlined removal action” to “streamlined response action.” Note that the observational approach is a streamlining approach. | See response to Comment 8. Text changes will be made throughout the document when concurrence is established concerning the appropriate terminology. |
| 49. | Page 4-1 3 rd paragraph | Change “one 200-UR-1 site (BC Controlled Area)” to “two 200-UR-1 sites (BC Controlled Area and West Lake)”. | Comment Accepted. |
| 50. | Page 4-1 Last paragraph | <p>Change</p> <ul style="list-style-type: none"> • “The EE/CA was prepared” to “The alternatives evaluation and cost analysis was prepared” and • “The EE/CA identifies” to “The evaluation identifies” and • “Thus the EE/CA serves as” to “Thus the evaluation, which is the equivalent of an EE/CA, serves as”. | See responses to comments 10 and 23. Text will be modified to be consistent with changes made in other sections of the document concerning the selected terminology. Need additional discussion with Ecology for clarification on these requested changes in terminology and regulatory pathway. |
| 51. | Page 4-1 | Delete last 2 sentences on page and replace with “Section 5.0 recommends the preferred response for the candidate | See responses to comments 8, 10, 23, and 50 concerning the requested changes |

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| | | sites.” | to terminology and regulatory pathway. Text will be modified to be consistent with changes made in other sections of the document. Need additional discussion with Ecology. |
| 52. | Page 4-2 to 4-5 Section 4.1.1 to 4.1.4 | No section is included for criteria for selection sites for MESC/IC/MNA. Add a section to discuss this, separate from the RTD section. | Criteria for selection of sites for MESC/IC/MNA is presented in Section 5.0 as part of the alternatives analysis for candidate RTD sites. Additional text will be added in Section 4.0, explaining the next step in the regulatory process in which an alternative analysis is performed. |
| 53. | Page 4-2 Section 4.1 | Provide a reference for the DQO document. It is difficult to review this document without the DQO. | Comment Accepted. Please note that a CD was provided to Ecology containing the current draft of the 200-UR-1 DQO document during the Ecology review of the Draft A Work Plan. |
| 54. | Page 4-2 Section 4.1 | The text references “the characterization approach outlined in WMP-19920 (pending).” Ecology has not reviewed or approved of this WMP. Therefore, it is impossible for Ecology to determine if the ‘characterization approach’ developed in the DQO process was adequately captured in the WMP since Ecology has seen neither document. | Comment Accepted. Please note that a CD was provided to Ecology containing the current draft of the 200-UR-1 DQO document during the Ecology review of the Draft A Work Plan. |
| 55. | Page 4-2 3 rd paragraph | Add west lake for completion of RI. | Comment Accepted. |
| 56. | Page 4-3 | Delete last paragraph on page. | Comment Accepted. |
| 57. | Page 4-4 Section 4.1.2 | The text states that “As appropriate, radiometric surveys and/or samples were collected to verify the completeness of the cleanup. For releases containing radiological constituents, no radiation warning signs or postings were | Comment Accepted. Additional text will be included to discuss in occurrence reports. These indicate that non-radiological constituents were not |

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| | | required following the cleanup because the actions taken resulted in acceptable exposure levels...The sites should not be considered waste management units because there is not longer evidence of an actual or potential hazardous substance release.” The text provides no discussion of non-rad hazardous substances at the waste sites. Please add text to address non-rad hazardous substances. | constituents of concern. Where a cleanup action was completed, radiological COCs were the predominant contaminant and served as target or indicator constituents. |
| 58. | Page 4-5 Section 4.1.3 | Insert text addressing how the movement of waste sites from one OU to another will be documented. The text is contradictory, in one place it discusses the 34 waste sites “inclusion with another OU for conducting remedial action” and in another place it discusses “designation of the new OU associated with the site” please clarify. | Comment Accepted. Text will be modified and include a discussion concerning reassignment of the 200-UR-1 waste sites to other operable units. |
| 59. | Page 4-5 Section 4.1.4 | Please change the 3rd bullet to read “Radiological surveys and or other non-radiological field-screening characterization techniques could will be used to determine the level and extent of contamination during the removal action.” | Comment Accepted with Modifications. Field screening characterization techniques for organic and inorganic constituents will be used, as appropriate, at sites where nonradiological constituents may be present. |
| 60. | Page 4-6 Last paragraph | Add West Lake for completion of an RI/FS. | Comment Accepted. |
| 61. | Page 4-7 Section 4.1.8 and Page B-3 Section B1.4.1 1 st sentence of section | These sections state that contamination located in the upper 15 ft of soil is not a threat to groundwater. Delete these sentences and replace with a reference back to Section 3.5.2, which will be amended in accordance with a comment above. | Discussions throughout the Work Plan concerning the assumptions and supporting information used to determine the potential impact to ground water from UPR sites will be modified. |
| 62. | Page 4-7 Section 4.1.8 | Include evidence proving the “Chemical and radionuclide contaminants from UPRs in the 200-UR-1OU.....are not a threat to groundwater.” | Discussions throughout the Work Plan concerning the assumptions and supporting information regarding the potential impact to ground water from UPR site will be modified. |

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| 63. | Page 4-7 2 nd and 5 th paragraph | Add West lake site to completion of RI/FS. | Comment Accepted. |
| 64. | Page 4-8 Section 4.1.9 | Modify text to include the use of VSP to determine the statistically adequate number of verification samples and locations. Also include text stating that verification samples will comply with requirements specified in WAC 173-340-740(7). | The sampling design and specifications for verification sample collection are presented in the SAP (Appendix B). Radiological surveys and nonradiological field screening (as appropriate) will be used in conjunction with the proposed verification sampling. VSP will be used to select sample locations, but not for statistical determination of number of samples. |
| 65. | Page 4-8 Sections 4.1.9 and 4.2 | Add west lake to discussion. Need to add a characterization approach for west lake. | Comment Accepted. |
| 66. | Page 4-9 Section 4.2.1 | Modify the 4 th and 6 th bullets to read: <ul style="list-style-type: none"> □ "Sampling and analysis for all potential COCs of soils at the soil location with the highest level of contamination for waste characterization and disposal decisions. A verification radiological survey and subsequent verification of soil sampling and laboratory analysis for all COCs to document the successful removal of contaminated media to levels below PRGs." | Comment Accepted with Modifications. Verification sampling and analysis will be performed for potential COCs on a site-specific basis. A list of the radiological and nonradiological COCs is provided in the SAP. COCs that will be evaluated at each candidate RTD site are identified using Tables B-15, B-6, and B-7. |
| 67. | Page 4-10 Section 4.2.2 | The first sentence should include a reference to Figure 2-4. | Comment Accepted |
| 68. | Page 4-10 Section 4.2.2 | The text states "In Phase I, the initial site evaluation characterization objectives are developed and focus on determination of current contaminant levels, development of the preliminary CSM, and determination of initial sampling and radiological survey specifications for a | Comment Accepted. The next sentence states, "The project is currently conducting Phase I activities". Text will be revised to include a discussion concerning use of the DQO process and |

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| | | limited field investigation.” This should have been completed through the DQO process and should be documented in the attached SAP. Please revise the document accordingly. | presentation of the scoping sampling plan in the SAP (Appendix B). |
| 69. | Page 4-10 | Delete “a unique,” in last paragraph. | Comment Accepted |
| 70. | Page 4-11 Section 4.2.2.1 | The text references “a Historical Site Assessment (HAS).” Provide a reference to this document or attach it as an appendix to this work plan. | Comment Accepted with Modifications. The reference will be provided. The HSA has been prepared as a separate document. |
| 71. | Page 4-11 Section 4.2.2.1 | What are “Derived Concentration Guideline Levels” and where do they come from. Please provide explanation in the text. | Comment Accepted. Additional discussion defining “Derived Concentration Guideline Levels” will be provided in the text |
| 72. | Page 4-11 Section 4.2.2.1 | The second bullet is “Development of initial scoping sampling and radiological survey specifications for a limited field investigation.” This should have been completed through the DQO process and should be documented in the attached SAP. Please revise the document accordingly. | Comment Accepted. Text will be revised to include a discussion concerning use of the DQO process and presentation of the scoping sampling plan in the SAP (Appendix B). Text changes will be made to be consistent with response to comment 68. |
| 73. | Page 4-8 Section 4.2 | Add West Lake to Section 4.2, and propose a characterization approach. | Comment Accepted |
| 74. | Page 4-12 Section 4.2.2.2 | Part 2, 1 st bullet: Define the term “key” in the bullet or replace it with a more detailed description of where samples are to be collected. | Comment Accepted. A more detailed description will be provided. |
| 75. | Page 4-12 Section 4.2.2.2 Part 2 | Please define “key areas” and explain how they are identified. | Comment Accepted. A more detailed description will be provided. Text changes will be consistent with response to comment 74. |
| 76. | Page 4-12 Part 3 Section 4.2.2.2 | Change the second bullet to read “Determine if sufficient data is available to estimate maximum and average calculate a 95% UCL for surface radiation COC levels in | Comment Accepted with Modifications. Maximum radiation levels and radiological COC concentrations will be |

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| | | each zone.” | documented. The true mean (as estimated by the 95% UCL on sample mean) will also be calculated. |
| 77. | Page 4-13 Section 4.2.2.4 | In the first bullet, include non-rad COCs for verification purposes. | An additional evaluation is being conducted to determine whether analysis of non-rad COCs within the BC Controlled Area is needed for verification purposes. The current conceptual site model does include distribution of non-radiological COCs by plants or animals at levels that would exceed PRGs. Further discussion is needed with Ecology concerning inclusion of non-rad COCs in the BC Controlled Area. |
| 78. | Page 4-13 Section 4.2.2.5 | In several places the text refers to a “treatability test” but it is not clear what the purpose of this text might be. Please add text explaining what the treatability test might be testing and how it will be used. | Comment Accepted. Text will be added to briefing explain the objectives of the treatability test(s). |
| 79. | Page 4-14 Section 4.2.3.2 | The text states that the “Survey criteria will meet the agreed-to Derived Concentration Guideline Level set for the BC Control Area.” Please provide a reference indicating where the “agreement” is documented. | Comment Accepted. Text will be added to explain how the “agreed-to Derived Concentration Guideline Level” for the BC Control Area will be established. This is the radiological survey scan capability as it corresponds to the measured activity in the soil. |
| 80. | Page 4-14 Section 4.2.3.4 | Change the last sentence to read “A list of the screening techniques and detection capabilities of the equipment, identified for use at UPR sites is presented in the SAP in Appendix B.” | Comment Accepted. |
| 81. | Page 4-15 Section 4.2.3.5 | The text states that “Verification analysis will provide the data needed to complete site closure documentation.” | See response to comment 42. Consideration of the groundwater |

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| | | Ecology would like to point out that the analytical detection levels used for the verification analysis must be low enough to document compliance with groundwater protection values established in WAC 173-340-747. In addition, the analytical results must be documented for all COPCs. | pathway will be addressed in a consistent manner throughout the document. Analytical requirements for COPCs will also be consistent with the identified exposure pathways. |
| 82. | Page 4-15 Section 4.2.4 | In the third sentence there is a double "that" please delete one. | Comment Accepted. |
| 83. | Page 4-17 Figure 4-1 | The bottom left box needs to be modified to indicate what happens if a waste site is NOT rejected by the regulators. | Comment Accepted. Figure 4-1 will be modified to include an additional step to address the need for confirmational sampling for certain candidate rejected or no action waste sites. |
| 84. | Page 4-18 Figure 4-2 | This figure needs to be modified to include evaluation of non-rad PRGs. | Comment Accepted. |
| 85. | Page 5-1 | Change Section 5.1 and 5.1.1 Titles from "... Justify Removal Actions" to "... Justify Response Actions". | See previous responses to the requested changes in terminology from "Removal" to "Response". Text will be modified to be consistent with the selected terminology used throughout the rest of the document. Our understanding in the development of the Work Plan was to include an EE/CA. This would be consistent with the CERCLA process and provide the basis for issuance of an Action Memorandum. Additional discussion is needed with Ecology concerning the regulatory pathway. |
| 86. | Page 5-4 | In 3rd bullet, change "Bioaccumulation" to "Bioaccumulation and bio-magnification" | Need input from Ecology concerning basis for making this requested modification. |

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| 87. | Page 5-4 | In last paragraph of Section 5.1.2.3, insert a new sentence between the existing first and second sentences: “US EPA guidance does not have a corresponding limitation.” | Comment Accepted. |
| 88. | Page 5-4 Section 5.1.2.3 | The text states that “most of the sites have been stabilized, thereby limiting ecological access.” However, Table A-4 indicates that several of the waste sites have no stabilization cover, or a shallow cover. Please revise text to accurately reflect the potential for ecological exposure. | Comment Accepted with Modifications. Text will be modified. Approximately half of the waste sites have a stabilization cover. |
| 89. | Page 5-4 Section 5.1.2.3 | The first bullet should include “inhalation” as an exposure pathway for invertebrates and burrowing mammals. | The Central Plateau Ecological DQO evaluated pathways and determined that inhalation was an insignificant pathway for invertebrates. Ecosystem protection evaluated using WAC 173-340-7490 through 7494 does not include evaluation of inhalation by ecological receptors. |
| 90. | Page 5-5 Section 5.3 | Modify the 1 st , 5 th , 6 th , and 7 th bullets to read: <ul style="list-style-type: none"> □ Prevent or reduce negative impact mitigate risk to human health, ecological receptors, and natural resources associated with exposure to soil or wastes contaminated above ARARs or risk-based criteria by removing the source or eliminating the pathway. □ Prevent or reduce mitigate occupational health risks associated with physical, chemical, and radiological hazards to workers performing removal actions. □ Minimize the general disruption of ecological and cultural resources caused by remediation and prevent adverse impacts | Comment Accepted with Modifications. The last RAO will be reworded to more clearly reflect the intent of this statement. Remedial actions will be conducted in an efficient manner in order to minimize the amount of generated waste. Cleanup requirements will be in accordance with the selected land-use outside the Core Zone. The land-use assumptions presented in the second to last bullet are consistent with the Comprehensive Land Use Plan. |

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| | | <p>to cultural resources and threatened or engendered species.</p> <ul style="list-style-type: none"> □ Provide conditions suitable for future industrial land use inside the Central Plateau Core Zone boundary and residential unrestricted land use outside the Core Zone. <p>Delete the last RAO. It implies removal and cleanup will be minimized to reduce the amount of waste generated.</p> | |
| 91. | Page 5-6 | Change "WAC 173-340 also specifies a . . ." to "WAC 173-340 specifies a standard point of compliance of 15 feet and a . . ." | Comment Accepted with Modifications. The text will be reworded to discuss the WAC standard point of compliance of 15 feet. |
| 92. | Page 5-6 Section 5.4.1.2 | The text only addresses the decay of radioactive contaminants. Add text addressing the remaining non-rad COCs which will NOT decay but may experience natural attenuation | Comment Accepted. |
| 93. | Page 5-7 | 3 rd paragraph in Section 5.4.1.3, change "Removal technologies do not" to "The observational approach does not". | Comment Accepted with Modifications. The text will be modified to state that a removal response using the observation approach does not.... |
| 94. | Page 5-8 and 5-9 | A traditional sampling DQO would consider the consequences of making a bad decision. For remediation, a decision to continue MNA and maintain existing soil cover could result in bio-intrusion and re-release of contamination. That's consistent with the history of the URs, and should be considered in "implementability" and "effectiveness" – please revise the text accordingly. | Comment Accepted with Modifications. Additional text will be added in the 3rd paragraph on page 5-9 where a failure of institutional controls is discussed. Because of the short vertical extent of contamination at the UPR waste sites where an existing soil cover is present, re-release of contamination caused by bio-intrusion, if it were to occur, would result in relatively minor redistribution. |

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| 95. | Page 5-8 Section 5.5.2.1 | Add a sentence that states that the risk reduction for this is low (as compared to the 5.5.3.1 RTD where the removal causes the risk reduction to be high). Also had that there is greater failure possibility of this option as compared to alternative 3. | A comparative analysis between Alternative 1, 2 and 3 is presented later in section 5.7. Table 5-5 summarizes each alternative based on effectiveness, implementability and cost, and addresses these aspects. The comparative analysis statements in this comment do not belong in this section. Additional text will be included in 5.5.3.1 to direct the reader to section 5.7 where the comparative analysis of alternatives is presented. |
| 96. | Page 5-8 Section 5.5.2.1 | The text states that soil covers will be maintained “until contaminant concentrations beneath the existing soil cover reach acceptable levels.” If non-rad COCs are present above PRGs they will not decay, please add text addressing natural attenuation of non-rad COCs. | Comment Accepted. |
| 97. | Page 5-9 Section 5.5.2.1 | The text states that “Confirmatory sampling would be used to determine the appropriate timeframe for decay of the constituents to acceptable levels.” Non-rad COCs will not decay, please add text addressing the natural attenuation of non-rad COCs. | Comment Accepted. Organic constituents are expected to attenuate. If confirmatory sampling analytical results show inorganic analytes above PRGs, the MNA remedy will be reevaluated. |
| 98. | Page 5-9 Section 5.5.2.1 3 rd paragraph | Detail what the risks would be long-term if the controls were to fail, including dispersion of contamination through animals, wind-blown contamination, etc. | Comment Accepted with Modifications. Additional text will be added to discuss long-term risks. The sites selected for this alternative would have a minimal potential for long-term risk from disturbance. |
| 99. | Page 5-9 Section 5.5.2.1 4 th paragraph | The majority of the UPR sites resulted in contamination from sites in the Hanford site boundaries, so controls and access are irrelevant in this discussion. Also, annual surface radiation surveys of specific waste sites do not | The discussion concerning current controls and access to UPR sites is appropriate in this section. The process allows for assessment and response to |

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| | | detect radiation that may have migrated out of boundaries if the soil cover were to fail. Delete this paragraph completely, or re-word to address these concerns. | maintain control of the site and soil cover conditions. |
| 100. | Page 5-9 Section 5.5.2.1 2 nd paragraph | Would sampling alone be enough to determine the possibility of mobility of contaminants through the soil during the period of natural attenuation? Address this concern in this section. | Comment Accepted with Modifications. Sampling and subsequent analysis of results will identify the constituents present. Distribution coefficients for the constituents and site infiltration rates will be considered in assessing vertical migration and mobility. The stabilization soil cover effectively reduces both infiltration associated with precipitation and lateral dispersion caused by wind. |
| 101. | Page 5-10 Section 5.5.3.1 | Please add to your discussion that alternative 3 would best address one of the main causes of the UPR's of animal intrusion and wind-blown contamination (that is, removal of the contaminated soil completely would delete this possibility of occurring again, compared to alternative 2) | Comment Accepted with Modifications. Additional text will be added to discuss how removal of contaminated soil would eliminate potential for future redistribution caused by animal intrusion or wind erosion. |
| 102. | Page 5-9 Section 5.5.2.2 | Please clarify what "technical difficulties may arise with equipment failure" and what equipment you are referring to. | Comment Accepted. The sentence will be clarified. |
| 103. | Page 5-9 | Under Section 5.5.2.2 change add additional text after the existing paragraph: "Conversely, there is substantial, site-specific experience that demonstrates the difficulty of isolating shallow contamination from plants and animals. Also, the cost of failure is relatively high. The BC Controlled Area is Hanford's largest waste site and it resulted from biological intrusion into shallow waste sites." | The physical characteristics of the site and contaminant source material available at the BC Cribs and Trenches that was dispersal by animals does not match the physical setting or waste characteristics of the UPR sites in this discussion. The UPR sites that are candidates for Alternative 2 have a small contaminant inventory distributed in a |

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| | | | thin veneer. |
| 104. | Page 5-9 Section 5.5.2.3 | Add to the costs the possibility that if controls were to fail, additional waste sites could be created that would need to be cleaned up in the future. | There is no way to determine the potential number of failures, level of effort or associated costs of this scenario. |
| 105. | Page 5-10 | For 1 st paragraph Section 5.5.3.1, replace last sentence with "Contaminated soil would be disposed of at the ERDF. Clean excavated soil would be used as backfill, or in some cases the excavation site would simply be recontoured without adding additional backfill." | Comment Accepted. |
| 106. | Page 5-10 Section 5.5.3.1 | Modify text to read: "Confirmation sampling will be used to verify that residual contamination levels do not pose unacceptable risks comply with potential ARARs." | Comment Accepted. |
| 107. | Page 5-10 Section 5.5.3.1 | Leaving contaminants in place below 4.6 m (15 ft) bgs, at concentrations that exceed the groundwater protection values specified in WAC 173-340-747, is not compliant with ARARs. The remediation of the 200-UR-1 OU Waste Sites should incorporate the requirements specified in WAC 173-340-350(9), WAC 173-340-360(2), and WAC 173-340-370(2). | Comment Accepted. Contaminants are not anticipated to be left in place below 15 ft at UPR waste sites. As indicated in the text, if contamination is identified below 15 ft during removal, additional measures would be required. Inclusion of PRGs for the groundwater pathway, and potentially other remedial alternatives would need to be considered in consultation with Ecology. Text will be added to clarify this point. |
| 108. | Page 5-11 1 st paragraph | Re-consider that movement of waste to ERDF would result in a "minor" reduction in mobility, given the importance of animal & plant intrusion as secondary release mechanisms for the URs. Revise your text accordingly. | Comment Accepted with Modifications. Text will be revised and the word "minor" will be removed. |
| 109. | Page 5-11 5 th paragraph | Other than BC Controlled Area, which sites are "larger, more complicated" and could require years to remediate? | Text will be added to specify that the as a group, the numerous railroad waste sites may require more time to remediate |

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| | | | than other UPR sites because of logistics associated with removal activities, waste handling, and disposition of multiple waste streams. |
| 110. | Page 5-12 | Delete 2 nd paragraph. It doesn't apply because "this condition is not expected in the 200-UR-1 waste sites." | Comment Accepted. |
| 111. | Page 5-13 Section 5.6 | Please revise the text to read: "For some sites, final cleanup requirements activities may be limited minimal, with removal costs reduced...." | Comment Accepted. |
| 112. | Page 5-14 Section 5.8 | Provide documentation supporting the statement "The UPR sites are not a threat to groundwater and mainly consist of surface radioactive contamination....." | Comment Accepted. Additional text will provided here and in other parts of the document to support the statement that the UPR sites are not a threat to groundwater. |
| 113. | Page 5-14 Section 5.8 | Is the statement "Generally placement of a soil stabilization cover was followed a decontamination or cleanup action" correct, or were the soil stabilization covers preceded by decontamination or cleanup actions? | This sentence will be revised to restate its intended meaning. |
| 114. | Page 5-27 Table 5-6 | Include sites that were not approved for reclassification. For sites where ecology is just requesting "confirmatory sampling", ecology requests creating a new category of just "samples" versus classifying them as RTD or MESC/IC/MNA. | Comment Accepted. |
| 115. | Page 5-27 Table 5-6 | Why does RTD have an asterisk following it? The asterisk is not included in footnotes. Delete if not used to signify something. | The asterisk will be replaced and an "a" inserted. The footnote for "a" can be found at the bottom of table 5-6 on page 5-28 |
| 116. | Page 5-27 Table 5-6 | 2 waste sites are listed as 220-E-110 and 220-E-115, correct to 200. | Comment Accepted. |
| 117. | Page 5-27 Table 5-6 | Site UPR-200-W-166 is listed for both preferred remedies. Therefore, instead of 52 waste sites for RTD (listed in introduction pg. V) there are 53 listed in table. | Comment Accepted with Modifications. Both remedies are identified for this site. RTD is the preferred remedy for |

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| | | If it is because both alternatives are identified, then treat all sites where both alternatives are identified as the same, and make note in the table. | removal of any residual contamination on the portion of the site that was scraped. MESC/IC/MNA is the preferred remedy for the portion of the site consisting of the scraped soil that is now under a soil stabilization cover. The table will be revised to clarify this. Accounting for two remedies at one site may lead to some confusion in summary statements concerning the number of remedies versus the number of sites. |
| 118. | Page 5-32 Table 5-7 | 200-W-106 facility area is labeled 200-W Pond, but it appears from your maps and description to be in T-farm zone. | Comment Accepted. Table will be corrected to indicate the facility area is T-Farm. |
| 119. | Table 5-7 and Appendix A tables | “Facility area” column—should this be called this, as your maps have it referred to as closure zones? If they are “closure zones” change the name of the column to match, or change map label. | Comment Accepted. Callouts and labels will be made consistent. |
| 120. | Table 5-7 | For sites that are MESC/IC/MNA, more clarification is needed as to why that approach is being taken versus RTD. Add specific justifications for each site identified | Comment Accepted. Additional text will be added in the column for justification. |
| 121. | Table 5-7 | Several waste sties have the preferred remedial alternative as both MESC/IC/MNA and RTD (including UPR-200-W-116 and UPR-200-W-166). The clarification as to why these are checked for both is not sufficient to understand—add additional explanations for these unusual sites. | Comment Accepted. Additional text will be added. See response to comment 117. |
| 122. | Page A-1 Table A-1 | Add West lake area to listing of the 200-UR-1 Operable Unit Waste Sites. | Comment Accepted. |
| 123. | Page 6-2 Section 6.1.1 | Revise the text to read: “....ACTION MEMORANDUM (or in other terms, an interim action ROD) will be | Text will be edited to be consistent with the changes made in other areas of the |

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| | | issued.....” | document where the regulatory pathway and decision documents that will be prepared for the 200-UR-1 waste sites are discussed. Additional discussion is needed between Ecology and DOE RL to clarify the regulatory pathway(s) for this OU. |
| 124. | Page 6-2 Section 6.1.2 | The paragraph that discusses CERCLA closure options does not address how these cleanup standards will be used in the 200-UR-1 OU. Please add a detailed explanation of how Method B and Method C cleanup standards will be used in each media and the regulatory path for each. Discuss how clean closure will be used at the 200-UR-1 OU waste sites. | Comment Accepted. |
| 125. | Page 6-3 Section 6.1.2 | Revise the text to read: “Public involvement, including public notices and an opportunity to comment, will be enhanced, as necessary, to satisfy CERCLA requirements. The public also will be able to review and comment on the FS and any proposed draft conditions that will be contained....” | Comment Accepted. |
| 126. | Page 6-4 Section 6.2.2 | Add the following bullet: Soil sampling and analysis for non-rad COCs. | Comment Accepted with Modifications. Text will be modified to clarify that soil sampling and radiological surveys will be performed as part of all remedy verification field activities. Analytical requirements are associated with the potential COCs groups (radiological only or radiological and nonradiological) that have been identified for each site that is a candidate for sampling. |

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| 127. | Page 6-4 Section 6.2.2.2 | Revise the text to read: "...Hanford Environmental Information System numbers, an inventory of investigation-derived waste containers, available waste designation information for radiological and non-rad COCs, and any chemical field-screening results." | Comment Accepted. |
| 128. | Page 6-4 Section 6.2.3 | <p>Please elaborate on the statements:</p> <ul style="list-style-type: none"> □ "During development of WMP-19920 (pending), listed waste issues were resolved." and □ "Sampling and analytical requirements or specific analytes needed to support designation activities were identified and the requirements noted in WMP-19920." <p>Ecology has not reviewed or approved of WMP-19920. It is impossible for Ecology to determine if waste is being managed in accordance with ARARs.</p> | Comment Accepted. Additional text will be added to elaborate on these statements. The 200-UR-1 DQO document (WMP-19920) will be issued to incorporate changes that may be needed following resolution of comments pertaining to the SAP. Please note that a current draft of the DQO was provided to Ecology on CD during Ecology's review of the Draft A Work Plan. |
| 129. | Page 6-5 Section 6.2.5 | Revise the text to read: "...based on radiological field screening and COC sampling results; documenting the extent of contaminated soils removed from the site and disposed of at ERDF; documentation of the verification radiological survey and COC sampling results; and..." | Comment Accepted. |
| 130. | Page 6-5 Section 6.2.5.1 | Ecology has not reviewed an official released DQO and can not determine if the "analytical quality criteria outlined in the DQO" comply with ARARs. Provide additional explanation. | Comment Accepted. The 200-UR-1 DQO document (WMP-19920) will be issued to incorporate changes that may be needed following resolution of comments pertaining to the SAP. |
| 131. | Page 6-5 Section 6.2.5.1 | Revise text to read: "...or risk-based levels if exposure data are available regulatory standards are not available and existing process knowledge...." | Comment Accepted. |

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| 132. | Page 6-6 Section 6.2.5.2 | <p>Revise the 3rd and 4th bullets to read:</p> <ul style="list-style-type: none"> □ “A site map showing the grid for the initial and verification radiological COC survey and the surface contamination delineated during the initial radiological COC survey” <p>A discussion of removal action including hot-spot sampling, excavation, field screening the excavation surfaces for continued presence of radiological COC contamination, soil screening, verification radiological surveys and COC sampling results, waste characterization, management and disposition, excavation backfill, compaction, and final grading”.</p> | Comment Accepted with Modifications. The 3 rd and 4 th bullet statements will be revised to differentiate between field screening activities for COCs (mainly radiological surveys, but includes other techniques if nonradiological COC could be present) and final verification radiological surveys and sampling and analysis for COCs. |
| 133. | Page 6-6 Section 6.2.6 | Suggest changing the title of this Section to “Remedial Investigation Report for BC Cribs Area” (and add Westlake site if reclassified into this operable unit). | Comment Accepted With Modifications. The RI report is for the BC Controlled Area (200-UR-1 OU waste site number UPR-200-E-83), not the BC Cribs Area. West Lake will also be added to the title. |
| 134. | Page 6-6 Section 6.2.6 | Revise text to read: “....and concentration of contaminants based on sampling results; evaluating the concentration of COCs against regulatory limits, assessing contaminant fate and transport;....” | Comment Accepted. |
| 135. | Page 6-7 Section 6.2.6.2 | Revise the text to read: “....by using a simple comparison of an the mean as estimated from the 95% upper confidence limit bound of the data to background concentrations, PQLs, and with appropriate cleanup levels.” | Comment Accepted With Modifications. This statement will be added in addition to comparison of the maximum detected value to background. This would be the most conservative approach. |
| 136. | Page 6-7 Section 6.2.6.2 | Revise text to read: “....against regulatory standards or risk-based levels if exposure data are available regulatory standards are not available and existing process knowledge.....” | Comment Accepted. |

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| 137. | Page 6-9 Section 6.2.6.3.1 | Revise text to read: "Risks initially will be evaluated by comparison to risk-based standards such as WAC 173-340-745740, "Unrestricted Land Use Soil Cleanup Standards for Industrial Properties." | Comment Accepted With Modifications. Additional text will be added to differentiate the risk-based standards for the portion of the BC Controlled Area located inside the core zone from the portion of the site located outside the core zone. |
| 138. | Page 6-9 Section 6.2.6.3.1 | Revise text to read: "Additional analysis will be performed using WAC 173-340-747(3) or (4), or an appropriate alternate fate and transport model (e.g., STOMP [PNNL-11216, STOMP – Subsurface Transport Over Multiple Phase: Application Guide]) will be established in accordance with WAC 173-340-747(8) to assess impact to the groundwater....." | Comment Accepted With Modifications. Text will be revised to indicate that additional analyses will be performed that will meet potential ARARs when assessing the impact to groundwater. |
| 139. | Page 6-10 Section 6.2.6.3.2 | Ecology has not reviewed the most recent versions of DOE/RL-2001-54 and can not determine if the "screening-level ecological risk assessment" is in compliance with ARARs. However, the ecological risk assessment will need to comply with requirements provided in WAC 173-340-7490 "Terrestrial Ecological Evaluation Process." Please revise text accordingly. | Comment Accepted With Modifications. Text will be revised to indicate that the ecological risk evaluation will be compliant with potential ARARs. |
| 140. | Page 6-10 Section 6.2.6.3.2 | In the first bullet, include "inhalation" as an exposure pathway for invertebrates and burrowing mammals. | See response to comment 89. |
| 141. | Page 6-10 Section 6.2.6.3.2 | The text states that "A risk management decision will be needed to determine how contaminants that do not have toxicity values will be handled during the risk assessment for each OU." Please insert text to clarify who will make that decision and when. | Comment Accepted. Additional text will be added for clarification. |
| 142. | Page 6-12 Section 6.2.6.3.2 | The Ecological risk needs to be evaluated against WAC 173-340 requirements as well as the eight-step EPA process. Please include this evaluation in the text. | Comment Accepted With Modifications. Text will be modified to state ecological risk will be evaluated using the EPA eight-step Ecological Risk Assessment |

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| | | | guidance and potential ARARs. |
| 143. | Page 6-12 Section 6.2.6.3.2 | The statement "Because most of the waste sites in this OU are within the core zone, generally only terrestrial wildlife risks will need to be evaluated....." is misleading. Numerous waste sites in this OU are in the core zone, but the BC Control Area encompasses a huge amount of land that is outside the core zone and is NOT considered industrial-exclusive land use. Please revise the text to include evaluation of waste sites within the core zone <u>and</u> waste sites outside the core zone. | Comment Accepted. Additional text will be added for clarification. |
| 144. | Page 6-13 Section 6.3 | This section reiterates the steps and remedial action alternatives for the FS process, as taken from Appendix D of DOE/RL-98-28. The document DOE/RL-98-28 was based on information and technologies available in 1997. A supplemental evaluation of technological developments should be provided in the forthcoming 200-UR-1 FS. Add text to section 6.3 indicating that the forthcoming FS will include information to update Appendix D in DOE/RL-98-28. Specifically: <ul style="list-style-type: none"> <input type="checkbox"/> Identify potential technologies and process options associated with each GRA <input type="checkbox"/> Screen process options to select a representative process for each type of technology based on their effectiveness, implementability, and cost Assemble viable technologies or process options into alternatives representing a range of treatment and containment plus a no- action alternative. | Comment Accepted With Modifications. Additional elements of the 200-UR-1 FS not identified in DOE/RL-98-28 Appendix D will be indicated. |
| 145. | Page 6-15 Section 6.4 | The last paragraph of section 6.4 "Three alternatives to the OU-by-OU remediation....." and the next three sections (6.4.1, 6.4.2, and 6.4.3) do not add any value to this section. Ecology suggests deleting this text. | Comment Accepted. |

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| 146. | Page 6-16 Section 6.5 | The text "Additional guidance for confirmatory and verification sampling is provided in Section 6.2 of the Implementation Plan (DOE/RL-98-28)" should be deleted. The guidance in Section 6.2 of the Implementation Plan is for characterization sampling, instead use WAC 173-340-740(7) "Compliance Monitoring." | Comment Accepted With Modifications. The incorrectly referenced sections of DOE/RL-98-28 will be changed to 6.2.3 and 6.2.4. |
| 147. | Page 7-2 Figure 7-1 | The Project Schedule does not include any schedule for the RTD sites. Please include work covered by the proposed action memorandum. | The schedule for remediation of candidate RTD sites will be negotiated between RL and Ecology. This schedule is "To Be Determined" and will not be included in this work plan. |
| 148. | Page a-1 Appendix A Table A-1 | Add a column indicating the remedy for the waste site (e.g., rejected, MNA, RTD, RI/FS, Reassignment). | Comment Accepted With Modifications. Table A-11 will continue to be used to list sites and provide general information. A new table will be prepared summarizing proposed actions and remedies as they currently apply to each 200-UR-1 waste site. |
| 149. | Table A-2 | Sites rejected or no action: Please update list to include areas that were actually reclassified. If including these areas, please provide the official rationale comment that is included in the letter that ecology has signed. | Comment Accepted. |
| 150. | Page A-77 Table A-4 | In site sorting information, there is a typo "980" instead of "1980". | Comment Accepted. |
| 151. | Page B-3 Section B.1.4.1 1 st paragraph of section | Modify the first sentence of this paragraph as follows: "The chemical and radionuclide contaminants from UPRs...within 4.6 m (15 ft) of the ground surface and are not considered a threat to groundwater. " | Comment Accepted With Modifications. Text will be modified to be consistent with other statements in the document after revisions have been made to address consideration of the groundwater pathway. |

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| 152. | Page B-5 Section B1.5.3 | Please modify the 1 st sentence of the section as follows: “According to the guidance in Table 6-5 ...are not significant because of the combination of low severity and continued accessibility of the sites ...” | Comment Accepted With Modifications. Text will be restated as “...combination of low to moderate severity and.... “ |
| 153. | Page B-5 Section B1.5.4 1 st paragraph | Either here or in section 4.2.1 add details about the sampling plans for “no action” sites. Include the sample design for non-radioactive COCs. The MARSSIM approach (section 4.2) planned for the rad COCs would be acceptable. | Comment Accepted With Modifications. Sampling specifications for “no action” decisions are provided in Section B3.7. Chemical screening techniques for non-radioactive COCs are discussed in section B3.6.2. Additional text will be added in Section 4.2 addressing “no action” sites. |
| 154. | Page B-14 Section B2.7.1 | In this section reference the section of this document that gives the sample design to be used for nonradioactive contaminants and radionuclides. | This section discusses quality control measures used when identifying sample locations. Sample design specifications are presented in Section B3.0. |
| 155. | Page B-18 Section B3.1.1.2 2 nd paragraph | This paragraph is highly speculative and unsupported; it is not useful. Delete this paragraph. | This section presents the Conceptual Site Model and the assumed site conditions. The discussion provides the assumptions made concerning the vertical contaminant distribution. It describes the site conditions that were considered during development of the sampling design. |
| 156. | Page B-20 Section B3.4 1 st sentence of paragraph | Insert a new sentence after the first sentence: “Contaminated soils are not expected to exceed 2 m (6.6 ft) in depth for the sites associated with the 200-UR-1 moderate scale spill/leak CSM (Figure B-17). If field observations or measurements, or analytical data indicate a depth of contamination greater than 2 m, a site would be sampled in accordance with the larger scale spill/leak site CSM (Figure B-18).”. | Comment Accepted With Modifications. The sampling design for moderate scale leak/spill sites and larger scale spill/leak sites is the same, as indicated in Section B3.5.1. A callout for Figure B-18 will be included in Section B3.5. |

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| 157. | Page B-21 and B-22 Section B3.5 and B3.6.1.1 | Provide in both of these sections the sample design that will be used for nonradioactive contaminants, or provide a reference to the proper section of the document. | Comment Accepted With Modifications. The third bullet in Section 3.6 on page B-21 will be revised to include nonradiological field screening (as appropriate). The bullet at the top of page B-22 indicates that verification analysis for chemical COCs will be performed at RTD sites where a liquid release reportedly occurred. |
| 158. | Page B-25 Section B3.9 | Correct "Figure B-18" to "Figure B-19" in the 5 th sentence. | Comment Accepted. |
| 159. | Page B-26 to B-27 Section B3.14 general | Add an explanation of how the number of survey and sampling locations were determined, and explain how the sampling design follows guidance from MARSSIM, or a similarly recognized document, for the type of survey and type of contamination. | Comment Accepted. Additional text will be added to discuss these items. |
| 160. | Page B-28 Section B3.14.2 | Provide in this section a statement about the sample design for non-radioactive contaminants. Depths of greater than 1 foot for sampling are probably required. | DOE RL is researching historical analytical results for samples collected in the BC Control Area and the BC Cribs and Trenches to determine if data exists for non-radionuclides. Sampling and analytical requirements presented in Appendix B for the BC Controlled Area will be modified as needed following the evaluation of the existing non-radioactive analytical data. Based on the outcome of the historical data review, further discussion concerning the requirement to collect non-radiological data will need to be conducted with Ecology. Historical radiological characterization results indicate that the |

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| | | | majority of contamination occurs within the upper 6 inches of the soil in the BC Controlled Area. An additional sampling interval from 1.0-1.5 ft. will be included at selected locations identified with the highest radiological activity to further assess vertical contaminant distribution. |
| 161. | Page B-59 Figure B-19 | Change the arrow from the box "Verify presence or absence of . . . " to point directly to the box "Stake site boundaries to encompass potentially contaminated area". | Comment Accepted. |
| 162. | Page B-59 Figure B-19 | From the box "Conduct screening of excavated material to determine if radiologically contaminated", add labels on the area to say "removed material" and "remaining material", to clarify the different directions from that box. | Comment Accepted |
| 163. | Page B-59 Figure B-19 | Insert a box that explains that samples will be collected to test for non-radioactive contaminants. This box should be added on the right of the diagram after the "No" arrow, after the box "Any radiological survey readings above background?" Only if there are no nonradioactive and no radioactive contaminants above regulatory levels should the documentation be submitted for regulatory concurrence. | Comment Accepted With Modifications. Additional text will be added to indicate field screening for radiological and non-radiological constituents will be performed at liquid release sites. Samples for laboratory analysis will be collected for verification of removal completeness or confirmation that no action is required. Liquid release sites will be analyzed for radiological and non-radiological COCs. |
| 164. | Page B-61 Figure B-21 | The first box has a bullet for "IH survey". Add IH to the list of acronyms in the front of the document. | Comment Accepted |
| 165. | Page B-68 to B-69 Table B-5 | The chromium (VI) soil cleanup level for direct contact is set by the inhalation pathway because Cr (VI) is carcinogenic via inhalation. Use 2 mg/kg as a soil cleanup level, which applies to the inhalation pathway | Available equations and parameters in the WAC are insufficient to calculate the soil cleanup level protective of the air pathway for Ecological receptors. |

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| | | and accounts for dust resuspension. | Clarification is needed from Ecology concerning the basis for the 2 mg/kg cleanup level and the receptors and conditions considered for its application. |
| 166. | Page B-68 to B-69 Table B-5 | There is a limit on the PRG for lead for the industrial scenario. Please correct table B-5: No limit 1000 mg/kg. This is the Method A value. | Comment Accepted |
| 167. | Page B-68 to B-69 Table B-5 | The following contaminants have industrial direct contact PRGs given as "No limit". Replace the "No limit"s with the following values: methyl ethyl ketone, 2.1E06 mg/kg; phenol, 2E05 mg/kg (considers dermal absorption); 1,1,1 trichloroethane, 3.15E06 mg/kg. | Comment Accepted in Part. Please note that for methyl ethyl ketone, and Trichloroethane, the quoted values are greater in concentration than pure product. Therefore, the "No limit" designation is correct. The quoted phenol value will be inserted as requested. However, it should also be noted that the phenol value represents 80% of the pure product concentration, which is why "No limit" was used. |
| 168. | Page B-68 to B-69 Table B-5 | The PRG for residential direct contact for phenol is 1.67E04 mg/kg; this value accounts for dermal absorption. Replace the 24,000 mg/kg with 1.67E04 mg/kg. | The standard Method B calculations are being used and do not require consideration of dermal absorption. |
| 169. | Page B-68 to B-69 Table B-5 | List the PRGs for each PAH of interest and for each pesticide of interest. | No specific PAH compounds or pesticides have been identified as PRGs. Based on analytical results for PAHs (Method 8310) and pesticides (Method 8081), PRGs will be identified and DOE/FH will seek concurrence with Ecology on their use. |
| 170. | Page B-68 to B-69 Table B-5 Page B-71 to B-78 | The PRGs for soil for the protection of groundwater, using default values for variables, are as follows in units of mg/kg: antimony 5.4; arsenic 2.92; barium 923; | See response to comment 42. This section will be changed as needed to be consistent with the rest of the document |

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| | Table B-7 | beryllium 63.2; cadmium 0.69; chromium (III) 2000; copper 0.8; lead 3000; mercury 2.1; molybdenum 32.3; nickel 130; silver 5.2; selenium 13.6; thallium 1.59; vanadium 2.24E03; zinc 5.97E03; nitrate-N/nitrite-N 40; cyanide 0.8; acetone 3.2; acetonitrile 0.282; benzene 0.028; benzyl alcohol 19.2; bromodichloromethane 3.68E-03; butanol 6.62; carbon tetrachloride 3.1E-03; chlorobenzene 0.87; dichloroethylene 0.36; 1,1-dichloroethane 4.37; 1,2-dichloroethane 2.32E-03; 1,1-dichloroethylene 5.22E-04; dichloromethane 0.022; p-dichlorobenzene 0.03; ethyl benzene 6.05; ethyl ether 9.09; hexane 96.2; MIBK 310; methyl ethyl ketone 21.8; tetrachloroethene 9.1E-03; phenol 44; toluene 7.3; 1,1,1-trichloroethane 1.58; 1,1,2-trichloroethane 4.27E-03; trichloroethylene 0.026; vinyl chloride 1.84E-04; xylenes 9.14; TPH 30; PCBs 0.21. Unless proper justification can be added to use other values for groundwater protection , add these values to tables B-5 and B-7. | concerning the groundwater pathway. |
| 171. | Page B-68 to B-69 Table B-5 Page B-71 to B-78 Table B-7 | Because the contamination in the BC control area came from the BC cribs the COC list for BC cribs should be used to complete the COC list for the BC control area. Isophorone, pentachlorophenol, and styrene are on the COC list for BC cribs. Add them to Table B-5 and B-7. | An evaluation of sampling and analytical data associated with the BC cribs and trenches is being conducted to determine if other COCs should be added to Tables B-5 and B-7. |
| 172. | Page B-68 to B-69 Table B-5 | Provide the rationale that allowed qualification for a simplified terrestrial ecological evaluation according to WAC 173-340 Table 749-1. Add a footnote in the table to tell the reader where to find this information in the document. | Comment Accepted. Additional text will be added. |
| 173. | Page B-68 to B-69 Table B-5 | The molybdenum concentration for a simplified terrestrial ecological evaluation at industrial sites is 71 mg/kg. Please insert this in Table B-5 if these sites qualify for a | Comment Accepted. |

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| | | simplified evaluation. | |
| 174. | Page B-68 to B-69 Table B-5 | After correcting this table with proper values and pathways, indicate in the table, using shading or any other suitable notation, the PRG that dictates cleanup for each contaminant. This will be the lowest value in each row of the table, or background. | Comment Accepted. |
| 175. | Page B-71 to B-78 Table B-7 | Cyclohexanone is not on the list of compounds for method 8260. Please check to see that the correct method is provided on Table B-7 for cyclohexanone. | Cyclohexanone is analyzed using method 8270. |
| 176. | Page B-79 Table B-8 | Ecology requests that you use plastic as a sample container for Cr (VI). Hexavalent chromium can adsorb to glass containers. | Comment Accepted. |
| 177. | Page B-81 to B-82 Table B-11 | Use of field instrumentation for non-radioactive contaminants is encouraged when detection limits are adequate, but for many contaminants these methods cannot detect contaminants at the cleanup levels for protection of groundwater. Physical samples of soil will be needed for verification to address contaminants with cleanup levels below the detection limits of the field instruments. | Comment Accepted. Soil samples will be collected for laboratory analysis using EPA methods for verification of the remedial response. Field screening instrumentation and analyses are used for in-process characterization, such as during the removal process. |
| 178. | Page B-83 to B-87 Table B-13, B-14, B-15 | The sampling scheme is too sparse for making decisions about cleanup. For instance, two samples are way too few to represent areas as large as 500 m ² . Soil variability generally increases with area. Contaminant concentration variability should be used as a basis for choosing sampling densities – the software package Visual Sample Plan should be used to determine the number of samples needed for verification. | Large sites are the result of dissemination of a thin interval of radiologically contaminated material, such as windblown particulates, tumbleweed parts, and/pr animal feces. Once this contaminated interval has been scraped off the site, a layer of native soil should be exposed at background concentrations. Thorough coverage of the site surface will be accomplished through a radiological walkover survey. For the instance cited, two representative |

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| | | | samples, that consist of 4 sub samples for each (a total of 8 sub samples), will be taken from throughout site. This sampling data along with the final radiological survey data will be sufficient to verify completeness of the removal. |
| 179. | Page B-81 Table B-16 | Add to this table the physical samples that will be taken in the BC Control Area to test for hazardous metals and PCBs. If radionuclides were dispersed by animal droppings in the BC Control area, metals from the BC cribs would accompany those radionuclides. Physical samples from the BC Control Area must be taken to demonstrate that there are no hazardous metals dispersed in the area. | See response to comment 160. |
| 180. | Page C-16 Table C-4 | Please add sufficient detail to the description of the cost estimating assumptions to explain the apparent discrepancies in unit costs between different sites. For example, the level of detail in the "C3.1 Trench Template" is insufficient for the reviewer to understand the difference in ERDF Disposal Costs in Table C-4. For example, the difference in ERDF disposal cost for Sites 200-E-29 and 200-E-53 is >50%, the difference between \$3.79 per cubic foot disposed and \$2.37 per cubic foot disposed. | Comment Accepted. Costs will be re-evaluated and the text will be revised as appropriate. |
| 181. | Appendix D | Revise the text to read: "In general, this CERCLA permitting exemption will be extended to all response action activities conducted at the 200-UR-1 OU waste sites, with the exception of the Resource Conservation and Recovery Act of 17-976 units, which will be incorporated into WA7890008967m Hanford Facility RCRA Permit." Ecology was not able to identify any | Comment Accepted. |

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| | | RCRA TSDs assigned to the 200-UR-1 OU. | |
| 182. | Page D-3 Appendix D Section D1.2 | Revise the text to read: “....specifically associated with developing risk-based concentrations for cleanup (WAC 173-340-740, “Unrestricted land use soil cleanup standards,” WAC 173-340-745, “Soil Cleanup Standards for Industrial Properties,” and WAC 173-340-747 “Deriving soil concentrations for ground water protection”).” Update Table D-2 accordingly. | Updates and/or changes to Table D-2 are being evaluated and will be discussed with Ecology. |
| 183. | Appendix D, Table D-2 | Chapter 4 “Potential Applicable or Relevant and Appropriate Requirements” of DOE/RL-98-28 lists multiple ARARs that should be include in Table D-2. Please re-evaluate potential ARARs and update Table D-2. | Updates and/or changes to Table D-2 are being evaluated and will be discussed with Ecology. |